PB82-197161

Contract Operations

(U.S.) Environmental Protection Agency
Washington, DC

[redacted]

Feb 82

U.S. Department of Commerce
National Technical Information Service
NTIS

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO. PB82 197161
4. TITLE AND SUBTITLE Contract Operations		5. REPORT DATE February 1982 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO. 430/9-82-004
9. PERFORMING ORGANIZATION NAME AND ADDRESS Same as box 12.		10. PROGRAM ELEMENT NO. 2BG 647 11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS Office of Water Programs Operations U.S. Environmental Protection Agency Washington, D.C. 20460		13. TYPE OF REPORT AND PERIOD COVERED Technical Report 14. SPONSORING AGENCY CODE 700/02

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This manual presents a discussion of the management and operating problems that contract operations can address. It is intended to give utility managers and local decision-makers a better understanding of this solution and a better basis for comparing contract operations to other solutions for reducing operating and management problems.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Water Pollution Control	Contracting Operations Management & Operations	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
	20. SECURITY CLASS *(This page)*	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

Office of Water
Programs Operations (WH-547)
Washington, DC 20460

February 1982
EPA-430/9-82-004

Water and Waste Management

EPA

Contract Operations

PB82-197161

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

This publication was prepared with the support of a grant from the U.S. Environmental Protection Agency's Municipal Operations Branch. The statements, conclusions and/or recommendations contained herein are those of the authors and do not necessarily reflect the views of the U.S. Government, the U.S. Environmental Protection Agency, or the Municipal Finance Officers Association.

CONTRACT OPERATIONS

TABLE OF CONTENTS

	Page
INTRODUCTION	1
WHAT IS CONTRACT OPERATIONS?	2
• TECHNICAL ASSISTANCE SERVICES	2
• CONTRACT OPERATIONS SERVICES	3
• COMPREHENSIVE SERVICES	5
• EXAMPLE OF OPERATIONS SUPERVISION	6
WHY DO MUNICIPALITIES USE CONTRACT OPERATIONS?	8
• MANAGEMENT AND COMPLIANCE PROBLEMS	8
• OPERATING PROBLEMS	9
• MAINTENANCE PROBLEMS	10
• PERSONNEL TRAINING PROBLEMS	10
WHAT CONCERNS HAVE BEEN EXPRESSED BY USERS OF THE SERVICE?	10
HOW CAN A UTILITY MANAGER DECIDE IF CONTRACT OPERATIONS IS THE BEST SOLUTION?	12
• OBTAIN ADEQUATE DESCRIPTION OF NEEDS	13
• DEFINE OPTIONS FOR ADDRESSING THE NEED	13
• EVALUATE THE OPTIONS	13
• SELECT THE OPTION	16
HOW SHOULD A UTILITY MANAGER SELECT A FIRM AND NEGOTIATE A CONTRACT?	16
• DEVELOP SCOPE OF WORK	16
• REVIEW CRITICAL ISSUES	19
• DEVELOP SELECTION CRITERIA	20
• STEPS IN SELECTING A FIRM	21
- COMPETITIVE SELECTION	21
- LIMITED SOLICITATION	23
- DIRECT NEGOTIATION	24
HOW SHOULD THE UTILITY MANAGER MONITOR PERFORMANCE AND RENEGOTIATE THE CONTRACT?	24

CONTRACT OPERATIONS

INTRODUCTION

There are a number of factors that have created operating and compliance problems at wastewater treatment plants. For example, strict effluent limitations, major plant expansions, complex operating procedures for newly designed equipment, and increasing energy costs can result in compliance violations and signficant plan operating problems. One solution to these problems is "contract operations," the contracting out of all or a portion of the operating functions of a treatment plan to a private firm skilled in the technical and management aspects of modern wastewater treatment facilities.

This manual presents a discussion of the management and operating problems that contract operations can address. It is intended to give utility managers and local decision-makers a better understanding of this solution and a better basis for comparing contract operations to other solutions for reducing operating and management problems. The discussion will focus on the following questions:

- What is contract operations?
- Why do municipalities use it?
- What concerns have been expressed by users of such services?
- How can a utility manager decide if contract operations is the best solution?
- How should a manager select a firm and negotiate a contract?
- How should a manager monitor performance and renegotiate the contract?

Included in the discussions are several actual examples of how contract operations has been used as one solution for reducing operating problems.

At the end of this chapter is a brief reference list of other documents that further discuss the technical and management aspects of contract operations.

WHAT IS CONTRACT OPERATIONS?

In response to the needs of the utility manager, private firms have developed a variety of services aimed at improving the operations and efficiency of wastewater treatment plants. As stated in earlier EPA documents, these services can be divided into two general categories:

- technical assistance services; and
- contract operations services.

A brief description of each service is presented here, but the primary focus is on contract operations services.

Technical Assistance Services

Technical assistance services have evolved as new, more sophisticated treatment plants have begun operations. They include design-related operation and maintenance (O&M) services and on-line O&M. Design-related O&M services include the development of O&M manuals and provision of start-up services.

Currently, on-line O&M services most frequently include those activities that were defined as grant eligible in EPA PRM 77-2:[1]

- training before and after start-up;
- fine tuning to optimize process control;
- laboratory procedures;
- maintenance management system;
- records management system; and
- revised O&M manual.

In addition, on-line services can include troubleshooting, process flow optimization, management operations evaluations, and special studies such as energy audits.[2]

---

[1] EPA Construction Grants Program Requirements Memorandum (PRM) 77-2.

[2] Ibid., p. 7.

Contract Operations Services

Contract operations can be defined as "the deployment of private sector personnel in a publicly owned treatment works for a definite period of time."[3] The three most common types of contract operations include:[4]

- Operations supervision - A private firm supplies a management team (which could include a supervisor and other key personnel, such as chief operator or laboratory person) to supplement the existing staff and to direct certain functions at the plant.
- Full staffing - The existing plant staff, including supervisors, is replaced or hired by the private firm. The firm agrees to provide all the services relating to the normal operation and maintenance of the plant. Full staffing gives the private firm more control over the plant by enabling it to select and employ the operators.
- Comprehensive services - The private firm assumes complete responsibility for operation and maintenance staffing, purchase of consumable materials, and the quality of the plant's effluent. In some cases, the private firm assists in replacement and capital investment decisions. The community pays a single monthly fee to the private firm, and the firm assumes complete responsibility for plant operations.

These services represent an increasing level of participation by the private firm and its staff in the control and operation of the treatment plant. Some municipalities have found that the operations supervision option allowed the municipality sufficient control over the plant and at the same time, provided the necessary expertise to meet effluent restrictions. In other cases, communities have felt the need to turn the plant's operations over to a private firm which provides full staffing for the plant.

In operations supervision, the utility manager would bring in contractor personnel to fill management positions as shown by the darkened boxes in the top half of Exhibit 1. In the comprehensive service option, the contractor will play a much larger role in control and staffing, coordinating all of the plant's maintenance and operating staff as shown in the bottom half of Exhibit 1. A more detailed discussion of comprehensive services is provided below to give the reader a more thorough understanding of this type of contract operation.

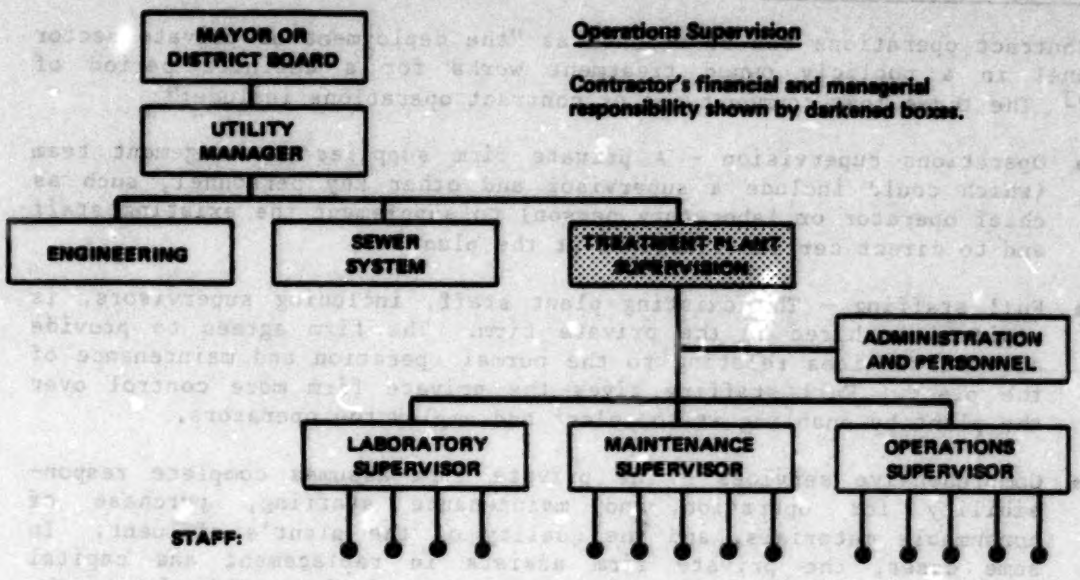
---

[3] Ibid., p. 8.

[4] Ibid., p. 8.

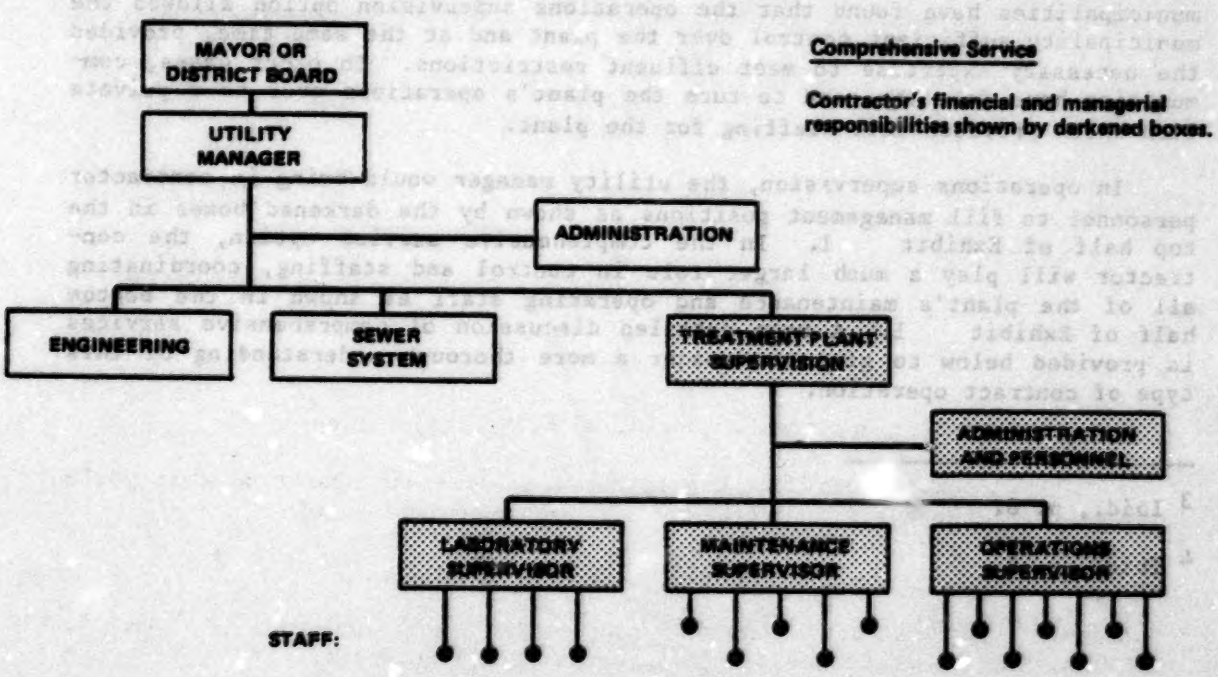
EXHIBIT 1

CONTRACT OPERATIONS
RESPONSIBILITIES OF CONTRACTOR IN OPERATIONS SUPERVISION AND COMPREHENSIVE SERVICE



Operations Supervision

Contractor's financial and managerial responsibility shown by darkened boxes.



Comprehensive Service

Contractor's financial and managerial responsibilities shown by darkened boxes.

Comprehensive Services

In the comprehensive, or as it is sometimes referred to as "full service" option, the private firm basically takes complete responsibility for the plant, its effluent quality, and fines that the municipality may be required to pay for compliance failures. These comprehensive agreements are often entered into when a municipality is faced with increasing compliance problems or when a major plant expansion or upgrading is required which the existing staff is not capable of operating effectively.

Under a comprehensive service agreement, the activities and responsibility of the contractor would include:[5]

- Management:
  - Assume responsibility for non-compliance fines up to a specified limit;
  - Improve general management control including accounting, scheduling, staff planning, and technical control;
  - Define plant deficiencies and identify corrective action;
  - Implement personnel training and performance review program;
  - Develop job descriptions;
  - Implement cost accounting and inventory control system;
  - Review computer and management information systems;
  - Develop a record keeping system;
  - Coordinate supervision and evaluation of plant personnel.
- Operations:
  - Assume complete responsibility for proper operation;
  - Develop process control strategies;
  - Direct operations according to city's objectives;
  - Identify modifications to plant process and operation that would improve effluent quality and reduce operating costs;

---

[5] "Management by Contract Operations and Maintenance Solutions," John A. Sedwick, Envirotech Corporation, delivered at EPA Seminars.

- Improve solids processing operation;
- Implement a safety review program;
- Study and reduce unit operations costs;
- Improve laboratory quality.

- Maintenance:
  - Develop and implement an effective equipment maintenance program and spare parts inventory procedure.
  - Implement a scheduled maintenance system to prevent deterioration of equipment.
  - Review equipment conditions and prioritize repair and replacement needs.
  - Review equipment downtime records and correct.
  - Improve plant appearance and housekeeping.
- Personnel:
  - Review personnel skills and develop training programs to supplement existing skills.
  - Develop job descriptions.
  - Prepare staffing plan.
  - Implement supervisor and staff training.
  - Increase employee state certification levels.

With comprehensive service, the contractor would operate the plant and would provide the management, supervisory, operating and support staff necessary to operate the facility.

Example of Operation Supervision

An example of an operation supervision arrangement would be the services being provided to a major municipality. In this situation, a private firm is handling the management of this treatment plant for a fixed budget. The services provided by the contractor under that agreement include:

1. Participation and advice in all levels of personnel supervision and evaluation, subject to the City's Personnel Policies and Procedure

Manual and the Master Agreement and addenda between the City and representatives of the City employees' bargaining unit.

2. Development and implementation of an organized equipment maintenance program.

3. Development and recommendation of alternatives for equipment and spare parts inventories.

4. Development, recommendation, and implementation of modifications in process and operation to improve effluent quality and decrease operations costs.

5. Preparation, recommendation, and support of data for the City's annual budgets.

6. In coordination with the Organizational Development Section of the City's Central Personnel Division, preparation, recommendation, and implementation of technical and professional training programs for personnel.

7. Recommendation of equipment and materials to be purchased for use in treatment plants and lift stations.

8. Preparation of bid documents and evaluation of bids for the City's purchase of equipment and materials within the requirements of state and local law concerning public purchases. However, the contractor is required to advise the City in writing, within a reasonable length of time, of any potential conflict of interest between its status as manager and supplier. The City Corporation Counsel determines whether a conflict of interest does, in fact, exist. In the event of such a conflict, management must determine whether contractor shall:

   a. not assist in the bidding process and be allowed to bid as a supplier; or

   b. both assist in the bidding process and be allowed to bid as a supplier.

9. Cooperation with City's Construction Program Manager and contractors in coordinating treatment plant operations with construction of City's Advanced Wastewater Treatment (AWT) facilities.

10. In cooperation with the Compensation Section of the City's Central Personnel Division, preparation of operational staffing plans for treatment plants, including proposed job descriptions and wage scales, as they exist and as they may be modified for AWT.

WHY DO MUNICIPALITIES USE CONTRACT OPERATIONS?

Municipalities have used contract operations to address the following problems:

- Management and compliance problems:
  - compliance violations;
  - cost inefficiencies;
  - inaccurate budget estimates;
  - growing administrative burden; and
  - complicated insurance requirements.
- Operating problems:
  - inadequate operating data and reports;
  - poor performance; and
  - plant design constraints.
- Maintenance problems:
  - deterioration of equipment;
  - unorganized maintenance scheduling system; and
  - inadequate spare parts inventory.
- Personnel training problem:
  - inadequate training;
  - salary ceiling;
  - no incentives; and
  - little opportunity for advancement.

In many cases, it is a combination of these problems which may trigger a utilities decision to consider contract operations.

Management and Compliance Problems

Contract operations is a service that appears to be evolving as a consequence of the EPA Construction Grant compliance process and is particularly suited to treatment plants that have built expansions with sophisticated equipment, had recurring operating problems, and face enforcement actions. Utility managers have found that the comprehensive contract operations option can provide guaranteed effluent quality (with certain limitations on the influent variability) and can protect the local municipality against continued non-compliance citations and fines. The non-compliance problem can be the result of staff training, operating procedures, maintenance procedures, or other factors which can be addressed by a comprehensive contract operations agreement. In addition, contractors can identify cost efficiencies and provide improved budget estimates for the plant operations.

In addition some municipalities have had a difficult time estimating the annual cost for operating their treatment plants and for achieving cost reductions through operating improvements and implementation of innovative operating procedures. Several municipalities have found that the use of contract operations allows a more stable estimate of the total cost for operating the treatment plant. This occurs because the costs are fixed by the terms of the contract with certain provisions for inflation that can be fairly well predicted. In one 24-million-gallons-per-day (MGD) secondary treatment plant, a contract operations agreement saved the city approximately $170,000 during its first year.

Because the contractor budgets and accounts for the cost, contract operations also provides a simpler technique for identifying and accounting for all costs which should be included in the user charges for the facility. This makes it easier for the municipality to calculate its annual user charge costs and adds predictability and financial stability to the procedure for estimating needed revenues.

In recent years, municipal officials have been required to spend more and more time on the administrative details associated with construction and operating wastewater treatment plants. This is an added cost to the community and reduces the amount of time that officials spend on the myriad of other local problems. For a facility that is facing recurring compliance and operating problems that require the attention of the administrative officials, contract operations can provide a means for reducing the compliance problem and provide the secondary benefit of reducing the amount of administrative time devoted to management of the treatment plant and its problems.

A second aspect of this issue is the reduction in the amount of personal liability, worker's compensation, and general liability insurance coverage that a municipality would need since this coverage would be picked up by the firm providing contract operations support. This, again, would reduce the amount of administrative time devoted to looking after the insurance and liability requirements for the treatment plant.

Operating Problems

Existing operating procedures for control of the wastewater treatment plant and the sludge disposal facility may not be sufficient to obtain high quality cost-efficient results. Contractors can provide improved process control expertise and experience from other facilities which could improve effluent quality and, in some cases, reduce operating costs.

Secondly, since it is often difficult to obtain all unit and operating costs for the existing system, the contractor can implement cost identification procedures and then act to reduce cost through management improvement programs.

Maintenance Problems

In addition, through contract operation utility managers can receive a more sophisticated approach to improving maintenance of the plant and for improving the general appearance and reliability of the facility. Several private firms offer, as a part of their contract operations package, a systematic approach to maintenance of equipment. These systems can automatically schedule maintenance, control inventory of spare parts and can include a system for detecting problems before they become major operating problems. A number of firms in this field have demonstrated an ability to assume responsibility for a plant and show dramatic improvements in effluent quality and a reduction in the number of occurrences of maintenance related problems.

Personnel Training Problem

Although the labor issue is one of the more complex parts of a comprehensive contract operations agreement, a number of positive impacts can occur for the existing treatment plant staff. The private firm often will provide training for the existing staff, attempt to solve any existing labor problem, provide, in many cases, equal or better pay, and create opportunities for advancement. Since, in some cases, the existing staff become employees of the private sector firm, they are now part of a professional organization and receive greater compensation and increased responsibility. A number of the contract operations firms have full-time labor relations experts who are familiar with the problems faced by operating personnel at wastewater treatment plants.

A summary of the elements of a contract operations agreement and how each element relates to problems identified in treatment plant management and operations is presented in Exhibit 2.

An Example

A community in California was experiencing a number of operating compliance problems at their facility. They contacted a consulting engineering firm which reviewed their design and operating procedures and indicated that they needed substantial improvement in their operating procedures. The review also indicated that the kinds of expertise needed to run the plant were not present and that it would be difficult to achieve compliance with the existing staff. This community decided to enter into a contract operations agreement and contacted several firms with expertise in operations and entered into an agreement to provide comprehensive operation of the facility by a private firm.

WHAT CONCERNS ARE EXPRESSED BY THE USERS OF CONTRACT OPERATIONS?

In general, utility managers contacted during the study indicated a favorable reaction to contract operations. However, a number of issues were identified which have caused some problems in the agreements. One of the

Exhibit 2

CONTRACT OPERATIONS

ANALYSIS OF PROBLEMS IN EXISTING OPERATIONS AND SERVICES PROVIDED BY CONTRACT OPERATIONS WHICH ADDRESS THESE PROBLEMS

Problems in Existing Operations	Contract Operations Services Which Addresses the Problem
Management Problems	
• Compliance violations	• Guarantees plant effluent
• Inaccurate budget estimates for rate making	• Provides fixed annual budget with estimatable corrections
• Administrative burden	• Reduces burden but requires some monitoring
• Inaccurate cost accounting	• Modifies cost-accounting system
• Inadequate recordkeeping	• Improves recordkeeping system
• No planning	• Provides activity plan
Operating Problems	
• Poor performance	• Defines plant deficiencies and identify corrective action
• Inadequate operating data	• Reviews computer and management information systems
• Inconsistent laboratory analysis	• Upgrades laboratory staff and procedures
Maintenance Problems	
• Deterioration of equipment	• Provides effective equipment maintenance program
• No maintenance schedule	• Improves maintenance scheduling system
• Unorganized spare parts inventory	• Upgrades inventory control system
Personnel Problems	
• Salary ceilings	• Salary based on market value of skills
• Inadequate training	• On-site training and evaluation
• No incentives	• Corporate incentives program

first problems identified by one municipality was the fact that the municipality still had to provide staff to monitor the performance of the private firm operating the plant. This was necessary to ensure that all maintenance was being performed and that all parts of the contract were being fulfilled.

In addition, the utility manager must continue to work with the private contractor in making decisions regarding long-term maintenance and capital improvements for the facility. This can be a complex decision-making process and the identification of whose responsibility it is to perform certain tasks needed to be continually reviewed.

A third problem was the complexity of the contract operations agreement. Due to the uncertainties faced by each party in a contract operations agreement, the development of the contracts for this alternative can be more complex than the normal contracting arrangements for obtaining consulting services. Since the contract operations firm will, in many cases, guarantee the effluent quality from the plant, contract language must be included which provides some protection if the influent to the plant exceeds certain limits. In addition, a number of other issues, such as pension fund conversions, and insurance changes make the contract documents more complex.

Also in some cases the contractors have placed new operating personnel in management positions and repeated the problems which had previously existed.

Predicted cost savings are not always achieved and new labor problems can arise.

Technical problems can arise which are beyond the contractors expertise and additional advisors may have to be retained. Finally, some local officials have stated that once a city starts contracting out its operation, it may be difficult to end the contract and return to a municipal operation. The city becomes dependent on the contractor's expertise and no longer has city staff to operate the plant.

An Example

In a western community, a contractor had worked several months with the utility manager developing the terms for a contract operations agreement. After detailed discussion, it was learned that a city labor contract provision stated that the city could not contract out the operation of the treatment plant.

HOW CAN A UTILITY MANAGER DECIDE IF CONTRACT OPERATIONS IS THE BEST SOLUTION?

The utility manager must go through a four-step process in identifying utility management needs and selecting solutions for those needs. The four steps include:

- obtain adequate description of the need;
- define options for addressing the need;
- evaluate the options; and
- select the option.

The four-step process is reviewed here as it relates specifically to the contract operations option to explain the types of analyses that will help the utility manager decide if contract operations is his best alternative.

Obtain Adequate Description of Needs

Through a Comprehensive Diagonostic Evaluation, specific compliance or operating problems and needs of the utility manager will be identified. In addition, the factors which caused the problem would be discussed and any legal or institutional issues which are related to the problem should be described. This analysis gives the utility manager a complete picture of the problem and places him in a better position to determine if each option will indeed solve the problem.

Define Options For Addressing The Need

There are normally several options for resolving an operating deficiency including in-house solutions, temporary outside assistance or contract operations. In identifying each of the options, time should be taken to define in some detail the scope of the option and an attempt made to establish as many parameters as possible for the cost and feasibility analysis which will be performed in the next step. Existing conditions should also be identified to provide a baseline for comparison with the options developed.

Evaluate the Options

Evaluation of the options which address the problem will first require a description of the utility manager's objective and criteria for screening and selecting the options. For example if the utility manager demands a 100% compliance record that would be one of his objectives.

An overview of a matrix format for assisting the utility manager in this evaluation is shown in Exhibit 3. The options that are to be analyzed are listed down the left hand side of the matrix and across the top of the matrix are entries for cost, which is subdivided into in-house direct costs, in-house administrative and overhead costs, outside contractor costs, and total costs. Continuing across the matrix are entries for risk, feasibility and effectiveness. In the cost category an estimate is developed for each option and particular attention is paid to the cost that would be incurred for both inside implementation of the option and for any outside contractors that might be required.

Exhibit 3

MATRIX FOR EVALUATING OPTIONS

Option	COSTS				Risk	Feasibility	Effectiveness	Cost/ Effectiveness	Issues to Consider
	In-house Direct Costs	In-house Administrative Costs	Outside Contractor's Costs	Total Costs					
Baseline Existing Conditions									
A									
B									
C									

For example, if one of the options would be contract operations, there would have to be costs entered for the in-house personnel that would monitor the contract and for the administrative and overhead time required to manage the contract. In addition, there may be costs for monitoring and other items which the municipality may have to continue to incur and those should be identified for a proper cost analysis.

The analysis also includes an assessment of the risks that will be faced by the community if each option is selected. For example if the contract operations option guarantees that fines and noncompliance penalties will be paid by the private contractor the city faces very little risk as compared to that situation where they are being held responsible for the fines. In addition if the Contract Operations Agreement calls for insurance and personal liability coverage to be provided by the outside contractor these burdens are removed from the city. And as indicated earlier a cost provision would be made for that difference.

The feasibility of each option with respect to its acceptability to local decision-makers, its legal implications, and its reception by existing workers will also come into play in analyzing the options. One problem that local communities might face in entering into a Contract Operations Agreement would be legal restrictions in union contracts or in agreements with other municipalities or intergovernmental agreements with other municipalities. This issue should be examined early in the options analysis so contract operations could be eliminated or actions taken to remove the legal restriction.

As the utility manager examines the options for solving operating problems and if contract operations looks like a viable option, then the city decision-makers should be consulted with to identify any objections that they might have to selecting the contract operations option. By performing this preliminary screening during the alternatives analysis, the utility manager can identify problems that may arise and attempt to mitigate these problems or eliminate the option.

The final entry would be an analysis of the effectiveness of each option in achieving the objectives identified earlier and in producing consistent compliance.

In evaluating the effectiveness of each of the options, it is important to consider the specific objectives of the city involved, the utility manager and other entities such as labor unions and existing management staff. By understanding the concerns and objectives of these groups and through working with them, the utility manager will understand any reservations with each of the options and will select the option which will best fit the needs of the utility and the objectives of the other parties involved. One factor in effectiveness may be a reduction in administrative burden, a reduction in operating problems, or a projection of reduced operating costs due to the implementation of operating efficiency.

Select the Option

Based on the analysis completed above, the utility manager can calculate a cost effectiveness ratio or other indicators to determine which of the options will best suit his needs for the identified problem. The selected option should be reviewed with local decision makers before additional steps are taken to implement the selected option. An example option analysis is shown in Exhibit 4.

HOW SHOULD A UTILITY MANAGER SELECT A FIRM AND NEGOTIATE A CONTRACT?

Once the local official has decided to obtain contract operations support, he has several options for identifying qualified firms, selecting the best one and negotiating the final agreement. Three important steps that precede the actual selection process are:

- clarify scope;
- review critical issues; and
- develop selection criteria.

These three steps provide the manager with a basis for making a contractor selection and for negotiating the final contract.

It should be remembered during the process that the decision to contract out services was made on the best assumptions and cost estimates that were available during the options available. If, as the selection and negotiation proceeds, the utility finds that the assumptions or cost analyses were incorrect, they should retain the option of reanalyzing the alternatives and redirecting their actions if the additional data prove that to be the best course of action.

The discussion which follows was developed primarily for the comprehensive services option but applies as well as to utility managers deciding how to select a firm for operations supervision or for staffing of a facility without responsibility for compliance.

Clarify Scope of Work

Although there are a number of different procurement strategies for identifying, screening and selecting a firm for a contract operations assignment, the first step that should occur in the process is the development of a detailed scope of work which can be based on the preliminary ideas formulated during the analysis of alternatives. Issues that should be addressed in the scope of work include:

- Location and number of plants - Identify the size, type of treatment, and the location of the facilities to be serviced.

Exhibit 4

EXAMPLE OPTIONS ANALYSIS

If a wastewater plant has an operations problem and has received a number of compliance citations, the evaluator will identify that problem and develop alternative solutions. These will be compared to existing conditions to provide a baseline for the analysis. Assume that some alternatives that appear reasonable are:

- improved training of existing staff by in-house personnel;
- training of existing staff by outside contractors;
- operation supervision of the facility;
- comprehensive service contract for the facility.

The evaluator would prepare an analysis of each alternative's cost, risk, feasibility, effectiveness and special issues to consider and present them to the local officials as follows:

Alternative	COSTS			Total Costs	Risk	Feasibility	Effectiveness	Cost/ Effectiveness	Issues to Consider
	In-house Direct Costs	In-house Administrative Costs	Outside Contractor Costs						
Baseline Existing Conditions									
In-house Training									
Contractor Training of Existing Staff									
Operations Supervision									
Comprehensive O&M Contract									

- Length of contract - Identify the duration of the contract and the expected starting date.

- Scope of operations responsibility - Since the contractor will only sign a performance guarantee for the effluent quality, yet the city defines the design loadings for the plant, these loadings must be spelled out in the agreement with the contractor. Also this specific processes that the contractor will be responsible for should be listed and the period for returning the plant effluent to an acceptable level after a violation of design loadings, should be defined. In general, all items the contractor should be aware of with respect to the operation of the plant should be clarified (should be noted that a number of the more detailed items will be worked out in the contract negotiating session).

- Scope of maintenance responsibilities/warranties and guarantees - Define the specific equipment structures and vehicles for which the contractor will be responsible. List all maintenance schedules and highlight the party that will be responsible for the maintenance of all warranties and guarantees for existing equipment. Explain the intended procedure for monitoring the maintenance performance of the contractor.

- Fines and fees - Define the terms under which the contractor will be responsible for fines and fees (up to a specified limit) levied against the city for noncompliance with its national pollutant discharge elimination system permit (NPDES).

- Reports to regulatory agencies - Identify the procedures that will be followed for providing all reports to regulatory agencies and specifically, the involvement of the contractor in this effort.

- Septic tank sludge - Define the amount of septic sludge that the contractor will have to accept at the facility.

- Laboratory analysis - Describe the specific laboratory analyses for which the contractor will be responsible and the mechanism for including that analysis in regulatory reports.

- Sludge and grit handling disposal - Detail the contractor's responsibility for disposing of the estimated volumes of sludge and grit. If the contractor has to provide a disposal site, that should also be presented in the scope of work.

- Industrial waste sampling - Define the responsibility of the contractor with respect to industrial waste sampling. Include the frequency and type of analysis that will be performed on the sample.

The development of this scope of work will provide the local utility manager, administrative, and elected officials who might have to approve the work with a clear understanding of the types of services that are being requested.

Since a contract operations agreement will cover a number of issues not normally covered in other technical assistance agreements, the local decision-makers can use the development of the scope of work as a means to identify and resolve critical issues which may impede the contracting process.

The utility manager has the option of providing a great deal of detail in the scope of work or providing a general scope of work and expanding on the terms of detail, after he has had preliminary discussions or received additional information from interested firms.

Local utility managers contacted as a part of this study indicated that they would like to retain local flexibility in the contracting process to obtain a contract that is most suited to their needs and which will be a workable agreement.

Review Critical Issues

There are a number of issues which the utility manager should be aware of as he proceeds through the contractor selection process. These issues are discussed here to alert the utility manager to considerations which, if ignored in the contracting process, may cause problems during the period of the performance of the contract. The issues include:

- Influent variation - Since the contractor will, in the comprehensive service agreement, guarantee the compliance with effluent requirements, an agreement must be reached on the variation that will be allowed in the influent to the plant. If the influent exceeds these allowable limits, the contractor will not be held responsible for the quality of the effluent.

- Existing personnel labor agreements and pension fund conversion - Since the labor agreements are a major consideration in any of these agreements, the city's agreement with all existing personnel should be clearly explained to the contractor including a plan for conversion of pension plans if necessary.

- "Hold harmless" agreement - The utility manager will want the contractor to sign a "hold harmless" agreement which means that the contractor will hold the utility manager and any board members, officers or agents harmless from claims for property damage or personal injury which arise due to the negligent operations of the contractor. It is also important to note that the contractor normally will not sign a "hold harmless" agreement for releases of treatment plant effluent into the air, land, or body of water and any subsequent property damage or bodily injury that may result from that release. Included in this issue is a determination of the utility manager and his organization's role in the defense of contractors if a release into the body of water occurs.

- **Compensation** - The annual compensation to the contractor and the terms for inflation adjustment should be clarified. Also, any compensation for additional services which might be over and above those defined in the initial agreement should be defined.

- **Insurance requirements** - The specific types of insurance that the city will want the contractor to carry should be identified early in the process. This would include compensation insurance, public liability and property damage insurance and other types of protection that the city would request.

- **Right of inspection** - Since the city will have to occasionally inspect the facilities to determine if the contractor is performing up to his agreement, then the city must maintain the right of inspection on the facility.

- **Experience requirements** - The city should outline the specific experience requirements expected of the firms prior to bidding on the contract.

- **Type of contract** - The utility can enter into a cost plus fixed fee or lump sum contract with the contractor. Since it is difficult for the contractor to predict changes in inflation and energy costs, it may be necessary to provide a provision to give this flexibility to the contractor. This option should be examined quite carefully so that the total annual costs for the contract remains a predictable value within certain ranges.

Additional issues that might arise that the utility manager should be aware of are:

- Right of ownership;
- Performance bonds; and
- Use of municipal vehicles.

The relevant detail to which each of these issues must be addressed will depend on the magnitude of the effort being contracted out and the previous working relationship that the city may have with the selected contractor.

Selection Criteria

Before beginning the selection process selection criteria should be established. Since the utility manager may receive a number of similar cost and technical proposals for the work, a set of screening criteria for the selection process should be established. A number of elements that could be included in that process are as follows:

- Responsiveness to needs - Make sure that the contractor understands the particular needs of the city and has responded in his proposal directly to the items identified in the scope of work.

- Ability to perform - The utility manager may want to check a list of references for each of the firms and review the technical and management expertise as it has been demonstrated in previous contract operation situations. A review should be made of operating experienced in similar plants of similar size and the contractor's ability to meet effluent requirements.

- Guarantees - The language proposed by the contractor in the guarantee section should be reviewed to determine if there are too many "loopholes" for the contractor to cite for reasons for non-compliance, which he will blame on the city.

- Cost - Although always a factor in the selection process, contractors that are not familiar with the requirements of the contract operations and the performance bonds and insurance requirements, may not reflect these costs fully in their bid proposal and this should be reviewed prior to the selection.

In addition to these criteria, the utility manager should develop other screening criteria such as previous work in the plant or the requirement for the types of personnel that would be assigned to the project.

Steps In Selecting a Firm

After developing the scope of work, the utility manager has several options for selecting a firm for contract operations (either operations supervision, full staffing, or comprehensive services). The options include:

- competitive selection;

- solicitation of bids from a limited group of firms; and

- direct negotiations with a previously identified firm.

The steps to be followed, in each case, and the issues to consider are presented in the following sections. Since the competitive selection option is the most complex, it will be discussed to highlight the steps that would be followed in the selection process.

Competitive Selection

The general steps in a competitive selection include:

- Requirements Definition;
- Request for Qualification;
- Screen for Prequalification;
- Request for Proposal bids;
- Evaluation of Proposals;
- Contract Negotiations; and
- Project Management.

To supplement that information, this section will highlight extra procedures and issues in each step which are unique to the selection of a contract operations firm. We have discussed the requirements definition (scope of work) step above, the section which follows will begin with the request for qualifications step.

Request for Qualifications

If a competitive process is used, the utility may want to have as many qualified firms as possible submit their qualifications. The Environmental Protection Agency has several reports which identify firms which have experience in this area and the city can use that list as a reference.

Screen for Prequalification

The utility manager may have to have an outside consultant assist him in the screening of the qualifications submissions and the recommendations of a firm to the city decision-makers. The unique factors which would be considered in the selection are:

- use of experience of operations and maintenance contracting;
- experience in operation of facilities, similar to the one in question;
- proven financial stability of the firm;
- ability of the firm to post a performance bond;
- list of references from the firm's current customers;
- proven technical management and backup expertise;
- labor relations experience of the firm; and
- general familiarity with the facility.

Request for Proposals

The request for proposals can be sent to the "short list" of qualified contractors and would include the scope of work, evaluation criteria, and the evaluation process that will be followed. For a contract operations proposal the manager should pay special attention to accurately describing the type of cost proposal requested, the specific responsibilities of the contractor, and the insurance and performance bond requirements for the contract.

Evaluation of Proposals

When the selected firms submit detailed technical proposals, the city and their legal counsel should review the specific parameters of the proposal to ensure that all of the activities requested in the scope of work are covered. Specific issues in the cost proposal which are of great importance include:

- identificatio of specific tasks to be conducted by the contractor;
- provision in the proposal for changes in labor costs;
- provision in the proposal for added activities; and
- clarification of specific expenditures that would be made for actions that would be taken to maintain the equipment, vehicles and structures at the facility.

Contract Negotiation

In the final negotiation of the contract with the selected firm, the city should make sure that the contractor will not assign any of the portion of the agreement to the subcontractors without the city's approval. In addition, other general contracting factors should be reviewed such as proof of insurance, and terms for renewal of the agreement.

Once the final contracts are signed, and the starting date established, the city then must plan on reviewing the performance of the contractor to ensure that he complies with his agreements. It is important that the City understand that the supervision and review will be required when they are making their decision to hire an outside contractor, since the costs for this activity must be factored into the decision.

Limited Solicitation

In a limited solicitation situation, the city follows the basic steps outlined for the competitive solicitation, except the city only sends the Request for Qualifications to a limited number of firms that they feel qualified to perform the activities. This pre-screening of qualified firms by the city can save a great deal of time in the review of qualifications' statements from firms which may not have the capability to perform the work. In

addition, this procedure may allow the city to move more quickly through the selection process.

Direct Negotiation

Several communities contacted during the research for this guidebook indicated that they preferred to enter into direct negotiations with firms they felt were qualified to perform the contract operations' role. This situation gives the utility manager a great deal of flexibility in developing the scope of work and the terms of the arrangements since he can have the benefit of input from an experienced contractor. This allows the utility to move quite quickly to the contracting process and could allow an initial contract of limited scope to be initiated almost immediately.

HOW SHOULD THE UTILITY MANAGER MONITOR PERFORMANCE AND RENEGOTIATE THE CONTRACT?

An important role for the utility manager and his staff in the contract operations situation is a formal arrangement for monitoring the progress of the contractor. Either through random checks or routinely scheduled reviews, the utility manager must be sure that the contractor is performing as stated.

The data gathered and reviewed combined with the record of cost and operating and maintenance problems which have arisen during the first year can form the basis for renegotiating the contract or for the selection of another firm. As mentioned earlier, it is important for the utility to realize that there will be some costs for the monitoring and contract administration functions, even in the comprehensive contract operations option.

In summary, the contract operations alternative may provide a cost-effective solution for some utilities and should be included in the options reviewed to solve the problems identified in the Comprehensive Diagnostic Evaluation.

REFERENCES

1. Contracting Out - A City Successfully Manages A Private Sector Water Treatment Operation", Government Executive, copyright 1980.

2. "Contract Operations of Publicly-Owned Treatment Works: Pitfalls and Profits for the Private Sector", Urban Systems Research and Engineering, Incorporated, presented at the 1980 Water Pollution Control Federation Conference, October 1, 1980.

3. "Management by Contract Operations and Maintenance Solutions", Envirotech Corporation, John A. Sedwick, presented at an EPA seminar.

4. "The Reality of Plant Operations and Maintenance Contracts", George E. Strudgeon, E. S. Environmental Services, Inc., California Water Pollution Control Association Conference, May 1, 1980.

5. "Wastewater Problem-Solving Using Contract Operation and Maintenance Services", Ray Maddocks, Administration, Capistrano Beach Sanitary District, 1980 Southern Regional California Water Pollution Control Association training seminar.

6. "Selecting An O & M Consultant for Wastewater Treatment Facilities", B. J. Murphy et al., Water Engineering and Management, March, 1981, p. 85.

7. "Private Sector Provision of Operation and Maintenance Services to Publicly-Owned Treatment Works", Executive Summary, prepared by Urban Systems Research and Engineering, for U.S. EPA, July 1980. (See also the complete final report published July 1980 under contract no. 68-01-5034.)

8. Management of Small to Medium-Sized Municipal Wastewater Treatment Plants, U.S. Environmental Protection Agency, Office of Water Program Operations, EPA No. 430/9-79-013, prepared by Culp, Westner, Culp, Cleanwater Consultants, July 1979. See pp. 123 - 129.

* U. S. GOVERNMENT PRINTING OFFICE : 1982 361-082/307